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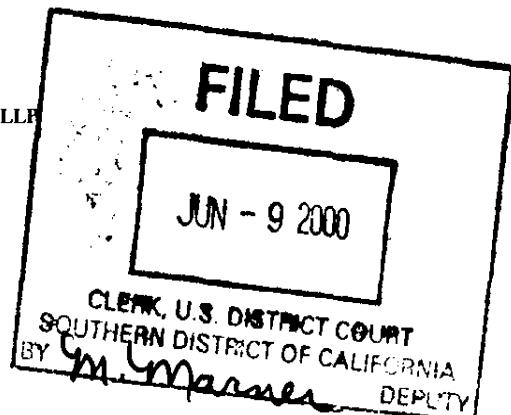
3:00-CV-01174 TAYLOR MADE GOLF CO V. BETA GROUP

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CMP.

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

'00 CV 11 74 BTM (CGA)

11 TAYLOR MADE GOLF COMPANY,
12 INC., a Delaware Limited Liability
Company,

Case No.

COMPLAINT FOR DECLARATORY
RELIEF

Plaintiff,

V

16 THE BETA GROUP, a California limited
partnership.

Defendant.

20 Plaintiff TAYLOR MADE GOLF COMPANY, INC. ("Taylor Made" or
21 "plaintiff"), by and through its attorneys, for claims for relief against defendant THE BETA
22 GROUP ("Beta" or "defendant") alleges as follows:

ORIGINAL

JURISDICTION AND VENUE

3 1. This is a civil action seeking certain declaratory relief regarding patent and
4 trade secret rights, and it therefore arises in part under the patent laws of the United States.
5 This Court has jurisdiction over the first claim for relief under 28 U.S.C. §§ 1331, 1338,
6 2201, and 2202. This Court has jurisdiction over the second claim for relief herein based on
7 the Court's supplemental jurisdiction pursuant to 28 U.S.C. § 1337, because it is so related to
8 the first claim for relief that it forms part of the same case or controversy under Article III of
9 the United States Constitution.

11 2. Venue is proper in the Southern District of California under 28 U.S.C.
12 § 1391(b) because a substantial part of the events giving rise to the claims asserted herein
13 occurred within this judicial district in that the alleged acts of purported misappropriation
14 and the alleged acts of purported infringement of defendant's patent have occurred within
15 this judicial district.

THE PARTIES

19 3. Plaintiff Taylor Made is a Delaware corporation having its principal place of
20 business at 5545 Fermi Court, Carlsbad, California 92008.

22 4. On information and belief, defendant Beta is a California limited partnership
23 doing business within this judicial district.

THE FACTS

5. Taylor Made has, since 1979, been in the business of manufacturing, selling and distributing golf equipment, including golf clubs, shafts, heads, golf bags, golf clothing and other golf related items, throughout the United States and the world.

6. Taylor Made was among the first to manufacture investment cast metal-headed driving and fairway clubs and has, since that date, introduced and sold full lines of drivers and irons, as well as specialty clubs and putters. Taylor Made's clubs have become known for their innovation and high quality and have become among the most popular clubs used by professional and amateur golfers.

7. Taylor Made is continuously researching and developing new technologies to enhance the performance of its golf clubs. As a result, companies frequently seek to present and offer for sale to Taylor Made purportedly new technologies and ideas.

8. In 1996, Beta asserts that it disclosed a concept to Taylor Made concerning a pixel technology for the clubface on putters. Beta asserts that the concept it disclosed is set forth in U.S. Patent No. 5,807,190 (the "190 Patent") which issued on September 15, 1998, and was assigned to Beta. A true and correct copy of the '190 Patent is attached hereto as Exhibit "A."

9. When Beta allegedly disclosed its pixel technology in 1996, Taylor Made had been independently researching and developing clubface technologies for years. In 1997, Taylor Made filed an application for a patent for its Nubbins® putter which utilizes a putterhead having a face with projections extending outwardly. Taylor Made introduced and promoted the Nubbins® putter at the January 1999 PGA Merchandise Show in Orlando, Florida. The Nubbins® putter soon became popular and successful.

FIRST CLAIM FOR DECLARATORY RELIEF
OF NON-INFRINGEMENT OF THE '190 PATENT

10. Plaintiff hereby incorporates by reference as though fully set forth herein the allegations of paragraphs 1 through 9, inclusive, above.

11. After recognizing the success of Taylor Made's Nubbins® putter, Beta again approached Taylor Made to try to sell its invention embodied in the '190 Patent. While accusing Taylor Made of stealing Beta's idea, by letter dated March 23, 2000, Beta acknowledged the distinction between its pixel technology and Taylor Made's Nubbins® product:

"Our objective in meeting is simply to have a conversation so that you can understand our technology better and appreciate why we believe replacing the Nubbins with a pixel-faced product is a good idea."

A true and correct copy of the March 23, 2000, letter is attached hereto as Exhibit "B."

12. By letter dated April 5, 2000, Taylor Made explained that it was "not interested in Beta's pixel technology" based on its earlier evaluation. A true and correct copy of the April 5, 2000, letter is attached hereto as Exhibit "C."

13. Through counsel, by letter dated May 17, 2000 (a true and correct copy of which is attached as Exhibit "D"), Beta thereafter accused Taylor Made of infringing the '190 Patent by introducing the Nubbins® putter and demanded that Taylor Made immediately suspend all further sales of the Nubbins® putter. Taylor Made vigorously disputes that its Nubbins® putter infringes the '190 Patent.

1 14. An actual and justiciable controversy exists over whether the Nubbins® putter
2 infringes the '190 Patent.

4 15. Taylor Made therefore seeks a judgment that (a) the Nubbins® putter does not
5 infringe the '190 Patent; and (b) Taylor Made is the sole and exclusive owner of the
6 technology embodied in the Nubbins® putter.

SECOND CLAIM FOR DECLARATORY RELIEF
OF NO MISAPPROPRIATION OF TRADE SECRETS

11 16. Plaintiff hereby incorporates by reference as though fully set forth herein the
12 allegations of paragraphs 1 through 15, inclusive, above.

14 17. Through counsel, by letter dated May 17, 2000, Beta accused Taylor Made of
15 misappropriating trade secrets developed by Beta and demanded that Taylor Made
16 immediately suspend all further sales of the Nubbins® putter. Taylor Made vigorously
17 disputes that it has misappropriated any trade secrets developed by Beta and vigorously
18 disputes that the Nubbins® putter incorporates any trade secrets developed by Beta.

18. An actual and justiciable controversy exists over whether Taylor Made has
misappropriated any trade secrets developed by Beta and whether the Nubbins® putter
incorporates any trade secrets developed by Beta.

24 19. Taylor Made therefore seeks a judgment that (a) Taylor Made has not
25 misappropriated any trade secrets developed by Beta and (b) the Nubbins® putter does not
26 incorporate any trade secrets developed by Beta.

PRAYER FOR RELIEF

WHEREFORE, plaintiff TAYLOR MADE GOLF COMPANY, INC. prays that this Court enter a Final Judgment in its favor and against defendant THE BETA GROUP as follows:

7 1. As to the First Claim, pursuant to 28 U.S.C. §§ 2201 and 2202, and Fed. R.
8 Civ. P. 57, for an order and judgment declaring that (a) the Nubbins® putter does not
9 infringe the '190 Patent; and (b) Taylor Made is the sole and exclusive owner of the
10 technology embodied in the Nubbins® putter; and

11

12 2. As to the Second Claim, pursuant to 28 U.S.C. §§ 2201 and 2202, and Fed. R.
13 Civ. P. 57, for an order and judgment declaring that (a) Taylor Made has not
14 misappropriated any trade secrets developed by Beta and (b) the Nubbins® putter does not
15 incorporate any trade secrets developed by Beta; and

16

17 3. On both claims for relief, for costs of suit; and

18

19 4. On both claims for relief, for such other and further relief as this Court deems
20 just and proper.

Dated: June 9, 2000

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP

Bv

Attorneys for Plaintiff
TAYLOR MADE GOLF COMPANY, INC.

US003807190A

United States Patent [19]**Krumme et al.****[11] Patent Number: 5,807,190****[45] Date of Patent: Sep. 15, 1998****[54] GOLF CLUB HEAD OR FACE**

5,575,472 11/1996 Magersman et al.

[75] Inventor: John F. Krumme, Tahoe City; Frank C. Dickinson, Redwood City, both of Calif.**OTHER PUBLICATIONS**Ellis, Jeffroy B., *The Clubmaker's Art, "More Materials"* Zephyr Productions, Inc. Oak Harbor, WA: 1997, pp. 319-357.**[73] Assignee: The Beta Group, Menlo Park, Calif.****[21] Appl. No.: 760,251**

Primary Examiner—William M. Pierce

[22] Filed: Dec. 5, 1996

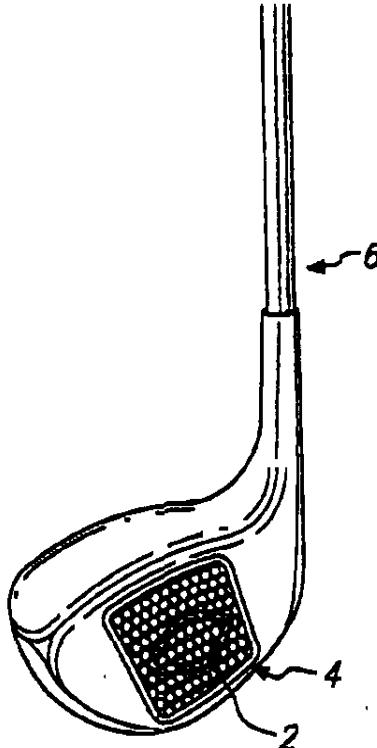
Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis, L.L.P.

[51] Int. Cl. 6 A63B 53/04**ABSTRACT****[52] U.S. Cl. 473/342; 473/329**

A striking face for golf clubs, such as a driver, iron or putter, includes zones of the same or different material arranged to create a desired "feel" to the golfer and/or produce a desired effect on the golf ball. For instance, the zones can be arranged to create a variation in mechanical properties across the striking face. The zones can be created by using "pixels" such as round or hexagonal rods arranged with their central axes perpendicular to the striking face. Pixels of a first material such as a shape memory alloy such as superelastic NiTi can be arranged in one or more concentric patterns and the remainder of the striking face can be made up of pixels of a second material such as beta-titanium, martensitic NiTi or stainless steel. The superelastic NiTi pixels can thus create a sweet spot on the striking face of the club.

[58] Field of Search 473/340, 329, 473/330, 331, 325, 342**14 Claims, 5 Drawing Sheets****[56] References Cited****U.S. PATENT DOCUMENTS**

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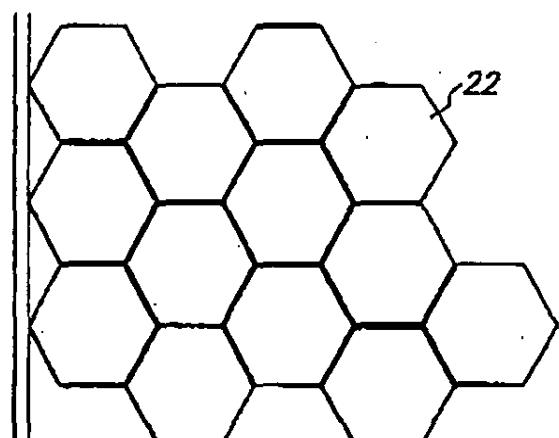
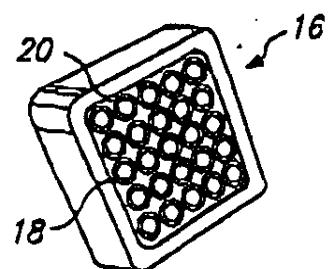
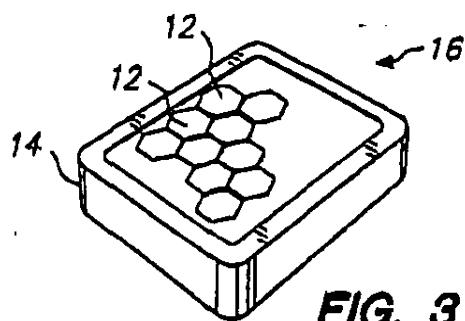
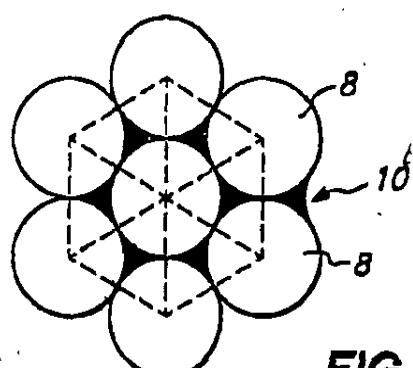
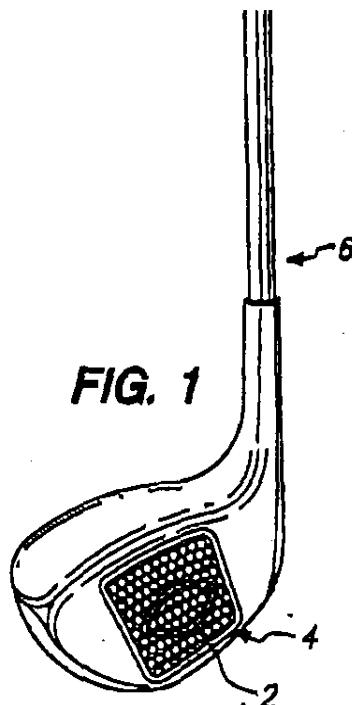
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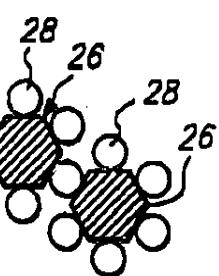
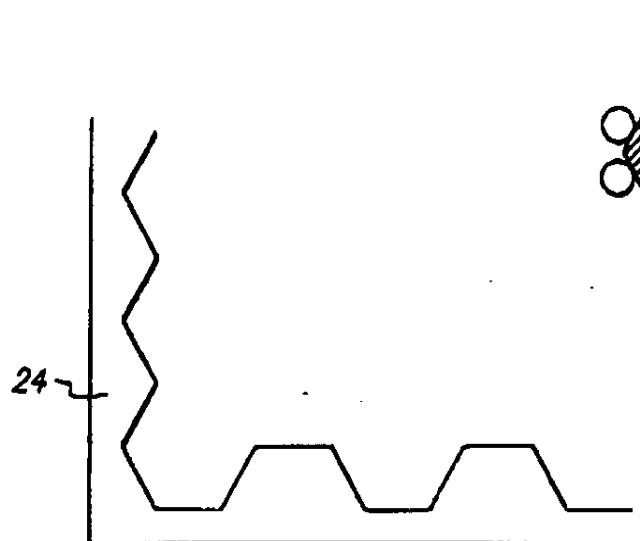


FIG. 7

FIG. 6

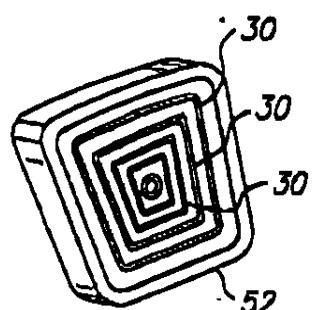


FIG. 8

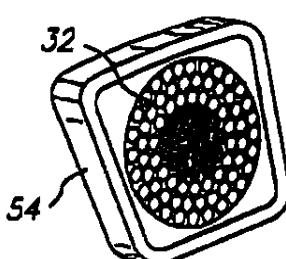


FIG. 9

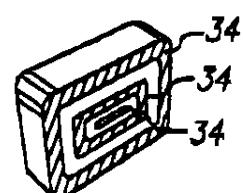


FIG. 10

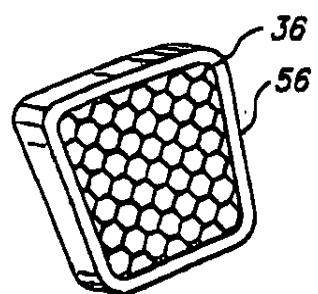


FIG. 11

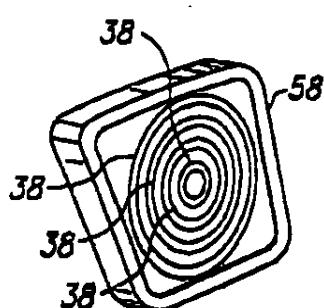


FIG. 12

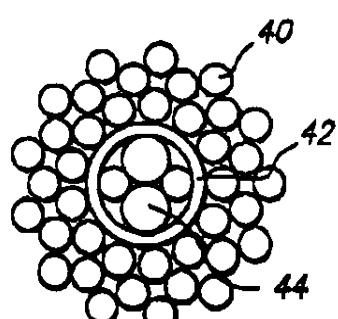


FIG. 13

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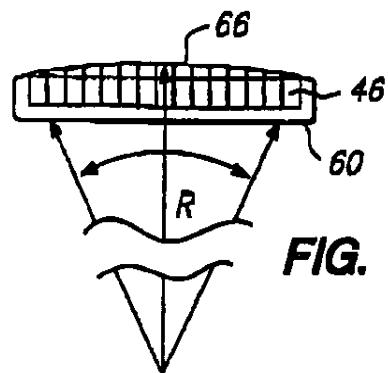


FIG. 14

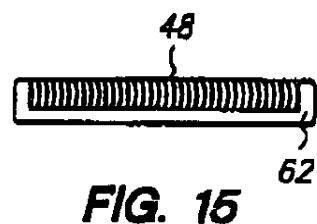


FIG. 15

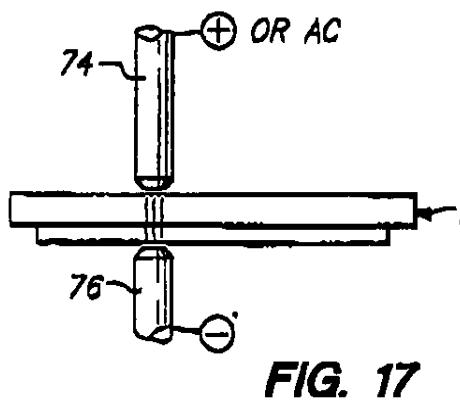


FIG. 17

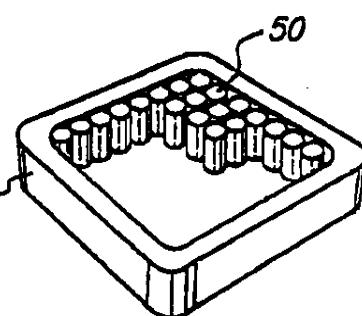


FIG. 16

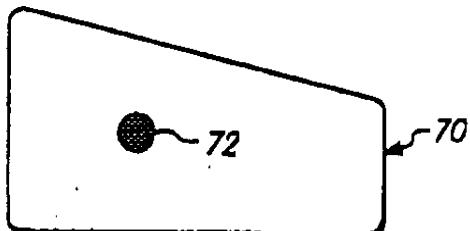


FIG. 18

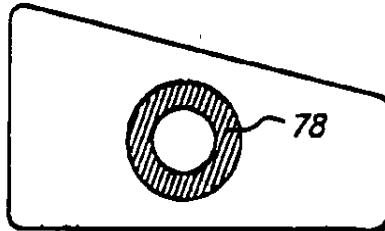


FIG. 19

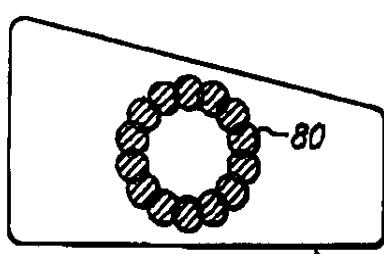


FIG. 20

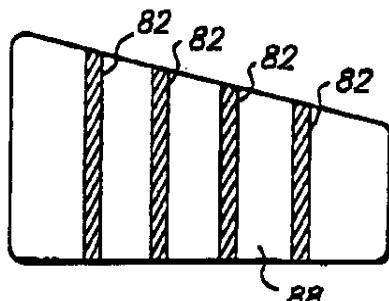


FIG. 21

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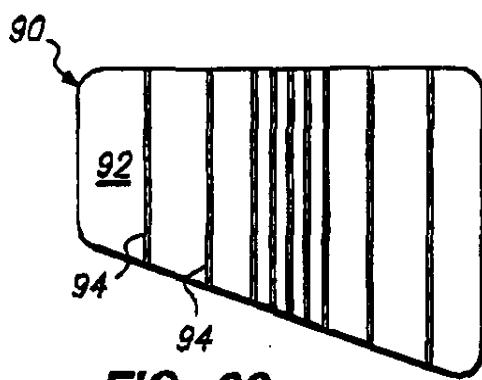


FIG. 22

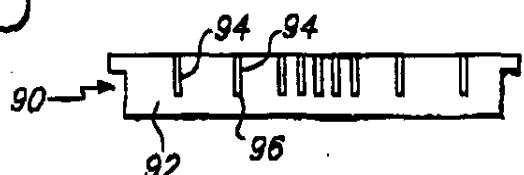


FIG. 23

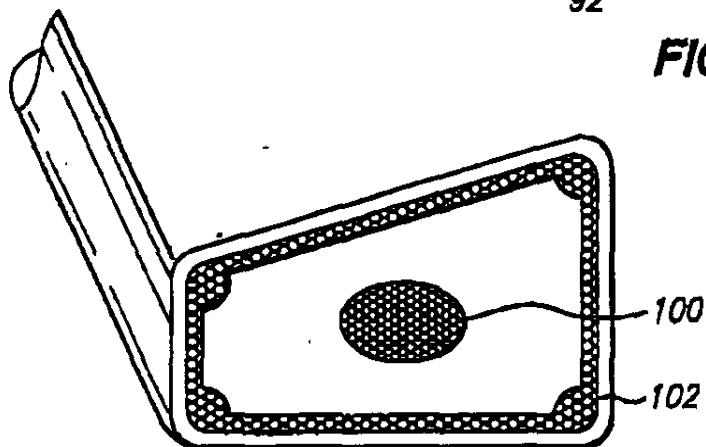


FIG. 25

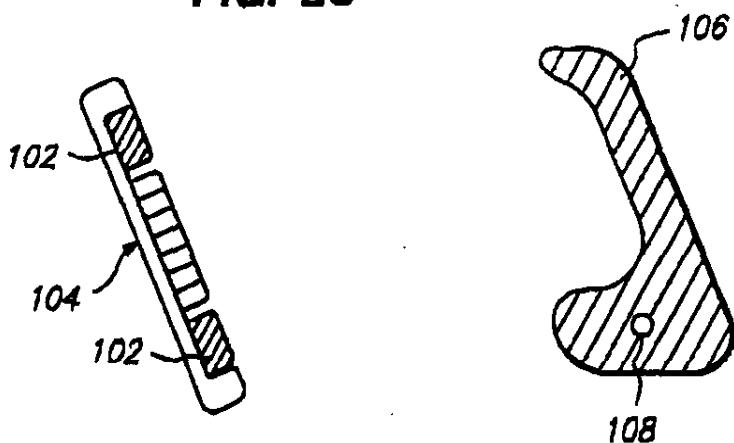


FIG. 26

FIG. 27
PRIOR ART

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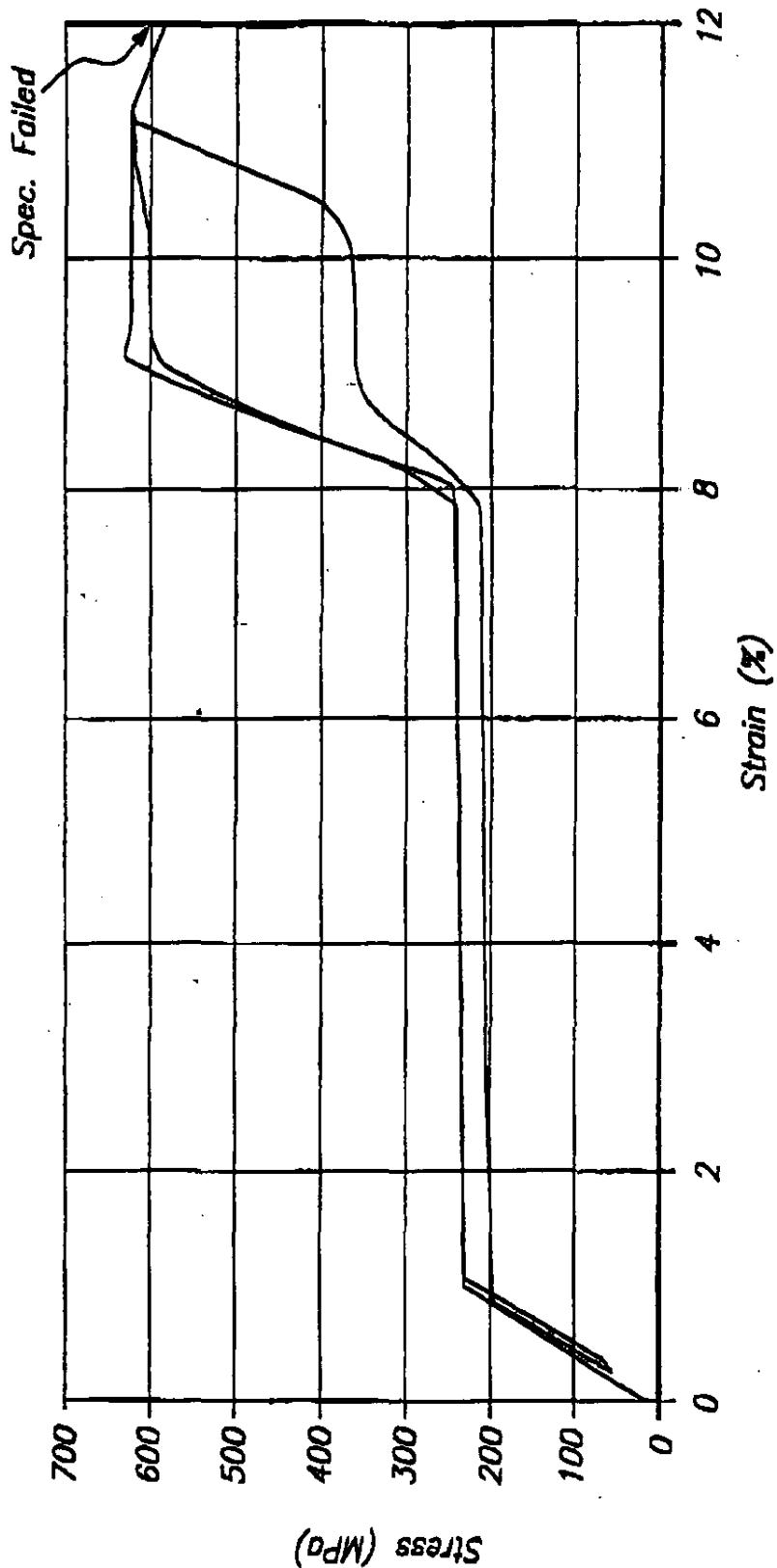


FIG. 24

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GOLF CLUB HEAD OR FACE

FIELD OF THE INVENTION

The invention relates to improvements in construction of golf club heads and faces for golf clubs such as a driver, iron or putter.

BACKGROUND OF THE INVENTION

A large variety of materials have been proposed and in fact used and offered commercially as golf club heads and faces. These materials have been applied monolithically or as inserts in the club face in an attempt to achieve more distance and/or more control over the ball. The list of materials includes polymers, ceramics, and metals, typically the most common, stainless steel, BeCu, and lately various titanium alloys, and shape memory materials such as NiTi based and copper based alloys.

Each of these materials has individual properties, different from each other but basically uniform unto themselves and hence provide a surface on a golf club that impacts the golf ball with essentially uniform mechanical properties across the face. For example, a typical titanium alloy such as Titanium 6-4 has a modulus of about 15 million psi and a yield strength of about 120,000 psi at a strain of less than 1%. Other materials will have different moduli and different yield strengths with different associated strain levels but as noted uniform properties as to themselves as used on the face of a golf club.

Since the mechanical characteristics (club speed, materials properties, geometry) at the impact of the club face with the ball determine the course (trajectory, distance, dispersion) of the ball; control of the materials properties can be key to control of the course of the ball. Club head speed and geometry being constant or independent of the specific properties of the material used as the impact surface of the club.

SUMMARY OF THE INVENTION

The invention provides a golf ball striking face of a golf club wherein first and second zones of material are distributed across the striking face, one or more of the first zones being surrounded by one or more of the second zones and the one or more first zones having a higher or lower modulus of elasticity than the one or more second zones. The first and second zones can be differentially heat treated zones of a unitary piece of metallic material. Alternatively, a plurality of the first zones can comprise discrete pieces of a first material such as a shape memory alloy and the second zone can comprise a unitary piece of a second material such as β -titanium or stainless steel wherein the first zones are embedded in the second material.

According to various embodiments of the invention, a plurality of the first zones can comprise individual wire segments arranged in a pattern with central axes of the wire segments intersecting an exposed surface of the striking face. The striking face can be planar or non-planar. A plurality of the first zones can comprise discrete pieces arranged in a pattern and the second zone can comprise a frame surrounding the first zones. The first zones can have various shapes such as polyhedral shapes, cylindrical shapes or any other desired shape. A plurality of the second zones can be separated by a plurality of the first zones such as alternating rings of first and second zones. For example, the first zones can comprise an annular ring and the second zones can include an inner second zone surrounded by the

first zones and an outer second zone surrounding the first zone. The first zones can comprise a perimeter weighting arrangement of an insert or club head of a golf club. Alternatively, third zones of material can surround the first and second zones wherein the third zones comprise a dense material providing perimeter weighting of an insert or club head of a golf club. The first zones can comprise solid or hollow metallic members. For example, the one or more first zones can comprise wires of single crystal CuNiAl and the wires can be arranged with central axes thereof intersecting the striking face.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a golf club incorporating a striking face in accordance with the invention;

FIG. 2 shows a "pixel" arrangement in accordance with the invention;

FIGS. 3-13 show various "pixel" arrangements in accordance with the invention;

FIG. 14 shows a "pixel" arrangement in accordance with the invention wherein the striking face is non-planar;

FIG. 15 shows a "pixel" arrangement in accordance with the invention wherein the wires forming the individual pixels comprise curved wire segments;

FIG. 16 shows a "pixel" arrangement in accordance with the invention wherein the pixels comprise tubes;

FIGS. 17-21 show an embodiment of the invention wherein a plate of material is differentially heat treated to create zones having different properties;

FIGS. 22-23 show an embodiment of the invention wherein the first zones comprise inserts received in grooves of a base material;

FIG. 24 shows a stress/strain curve of a wire sample of a single crystal CuNiAl wire;

FIGS. 25-26 show an embodiment of the invention incorporating perimeter weighting; and

FIG. 27 shows a prior art perimeter weighting arrangement.

DETAILED DESCRIPTION OF THE INVENTION

The invention allows the mechanical properties of the striking face of a golf club to be controlled and varied at will in incremental areas on the impact face of the club of as small as 0.0001 square inches. Use of the invention can hence allow the properties of the club face to vary in any pattern over the impact area. As shown in FIG. 1, an elliptically-shaped "sweet spot" 2 on the club face 4 of a driver-type golf club 6 can be created that varies mechanical properties in concentric rings (or any other desirable pattern) in the impact area from high modulus to low modulus and/or any combination of high yield strength and elastic strain characteristics. An analogy to aid in understanding the invention, is a TV screen. Picture the TV screen as the impact area of the golf club and the individual pixels as individually selectable materials from the whole gamut of available materials. One can then see that any conceivable pattern or combination of materials properties can be achieved on the "screen" (impact face) by simply selecting the pixels, as desired, by analogy as a TV image on the screen can be generated. Further picture the individual pixels themselves as having selectable geometry such as round or hexagonal shape. For example, if hexagonal geometry were chosen for individual pixels, the pixels would stack in a

matrix essentially "tight packed" allowing almost no space between individual pixels while if a round geometry is chosen, the stacked pixels 8 would create interactions 10 (see FIG. 2) between pixels that in turn could be made from any desirable material either the same or different from the round pixels themselves. It can be seen that an infinite combination of materials properties can be created by the combination of choice of "pixel" size and shape and material. The range of the invention allows, at one end uniform properties across the golf club face by selection of a single material, and at the other end an infinite variation of properties in any pattern across the face, by selection of the "pixel" size, shape and material.

The method to create the striking face according to the invention is quite simple. Using the TV screen analogy, picture the pixels as the ends of individual wires of selected materials such as titanium or polymer or preferably highly elastic shape memory materials (e.g., NiTi based materials). As shown in FIG. 3, the hexagonal-shaped wires 12 are tightly packed into a frame 14 and bonded in a matrix of epoxy polymer (or sintered metal powder or solder or other adhesive matrix). This frame is made to the proper size for an insert 16 on the face of a golf club, either a driver or an "iron" or putter. The framed matrix of "pixels" of wire is then formed by machining or grinding to club face geometry and applied to a club. The resulting insert 16 as noted above can be designed to any desirable combination of materials properties simply by selecting the desired wire materials and diameters or cross sectional geometry. FIGS. 4-7 illustrate the invention in several forms. FIG. 4 shows round "pixels" 18 of uniform diameter in a matrix 20 of epoxy polymer. FIG. 5 shows the pixels 22 as tight packed hexagon cross sections, FIG. 6 shows a frame 24 which mates with the hexagon-shaped pixels, and FIG. 7 shows a combination including a variation of pixel sizes 26,28. Note that the frame can be retained as part of the insert or removed after the "pixels" are bonded together.

As noted above the pixels may also vary in material selection. FIG. 1 illustrates an elliptical "sweet spot" 3 in which the central zone is of a material with a high modulus and progressively the modulus is varied toward the borders of the impact face by selecting materials with progressively lower modulus. Of course, the opposite combination of materials properties (e.g., low modulus at the center/high modulus at the outside) could be implemented or any other combination or a uniform material could be selected.

The preferred embodiments of the invention include various designs for maximum control (minimum dispersion), maximum distance, or ideal combinations of distance and control. Various patterns for the impact zone are illustrated in FIGS. 8-16 wherein pixels 30,32,34,36,38,40,42,44,46,48,50 are arranged within frames 52,54,56,58,60,62,64.

The thickness of the "pixel" matrix can also be varied to create a "Z" axis variation in mechanical response of the club face. This thickness variation can be accomplished by machining of the front or back or both sides of the framed insert or the impact surface of the insert can consist of shorter and longer "pixels" that create a 3 dimensional effect on the impact surface as illustrated in FIG. 14 wherein striking face 66 has a curvature of radius R and the pixels 46 increase in length towards the middle of frame 60. Since materials can be individually selected for properties, surface geometry of the impact surface can also be modified and customized by selective chemical etching of the surface. For example, if a combination of titanium-nickel and aluminum "pixels" were selected, chemical etching of the impact surface using a strong basic solution would result in the

aluminum elements being etched away at a rate much higher than the nickel-titanium materials. The surface therefore would exhibit raised nickel-titanium elements among lowered aluminum elements. This same basic process can be applied to a variety of materials including polymers to achieve a surface on the impact zone to idealize grip or spin imparted to the ball similar to the now conventional grooves, dots, holes and indentations found on club faces. This process can also be used to produce differences in colocation of the materials, which by controlling patterns of application can be used to produce visually observable logos, designs and/or service marks such as company names on the surface to the inserts.

The frame constraining the pixel matrix can be made of materials such as stainless steel, by machining, forging or casting. A polymer frame may also be created by molding or machining. A temporary frame may be used to create the insert form as a matrix bonded together by epoxy resin and then the frame may be removed leaving a frameless insert for application to the club face in an appropriate recess or receiving cavity on the club. The back side of the "pixel" matrix may be supported by the frame structure or the receiving cavity of the club may support the backsides of the matrix or both in combination.

In another variation of the invention, the individual wires 48 ("pixels"), may be curved or bowed (see FIG. 15) to allow both compression and bending strain upon impact with the ball. The individual pixels 50 may also be hollow, for example, thin wall tubes either empty or the lumen filled with another material such as polymer or alternately filled or partially filled with metal or polymer or ceramic material, as shown in FIG. 16.

The invention is additionally illustrated in connection with the following Examples which are to be considered as illustrative of the present invention. It should be understood, however, that the invention is not limited to the specific details of the Examples.

"Driver" Example

An insert for a golf club "driver" consisting of optimized elastic nickel-titanium wires and beta titanium wires in an epoxy matrix with the higher modulus beta titanium wires forming an outer circular zone of impact and the lower modulus nickel-titanium forming a circular inner zone of impact. This embodiment allows a combination of long distance from the high modulus beta titanium and control from the lower modulus very highly elastic non linear strain characteristics of the nickel-titanium. This arrangement approximates the strain distribution on the ball as it is deformed by the face of the club. Closer approximations are possible by reducing the size of the pixels and adding a third or fourth material and so on with moduli progressively varying. The "opposite" example could consist of high modulus beta titanium or even higher modulus stainless steel forming an inner zone with NiTi lower modulus forming an outer zone.

"Iron" Example

An insert for a golf club "iron" consisting of a matrix of hexagonal wires per the invention made from highly damping superelastic NiTi alloy or a combination of superelastic NiTi and martensitic NiTi alloy materials. This embodiment would allow a solid yet vibration reduced feel upon impact since the NiTi material in a superelastic or optimized elastic condition has a damping effect resulting from energy absorption deriving from its stress/strain hysteresis behavior.

"Putter" Example

An insert for a golf club putter consisting of a matrix of martensitic NiTi wires alone or in combination with polymer wires. This embodiment is designed to maximize damping (vibration reduction) on impact with a resulting "dead" or "soft hit" feel for maximum control of the ball in putting.

"Differentially Heated Treated" Example

FIG. 17 shows an insert 70 for a golf ball striking surface of a golf club wherein the insert is a solid piece of NiTi based shape memory alloy. The solid piece of NiTi is differentially heat treated such as in a uniform or non-uniform pattern to control the mechanical properties across the interface and achieve an effect similar to the "pixel" approach discussed above. The differential heat treatment preferably provides finite zones 72 surrounded by or surrounding adjacent zones which are unaffected by the heat treatment. The heat treatment can be implemented, for example, by patterning electrodes arranged perpendicular to and opposing the surface being heat treated and passing AC or DC current through the electrodes. The heat treatment step can be carried out by running electrical current from electrode to electrode through the material in order to effect localized heating and provide one or more heat treated zones corresponding to the shape or shapes of the opposed electrodes. In FIG. 17, a nickel-titanium based shape memory alloy insert 70 for a club face is located between a pair of opposed electrodes 74,76. FIG. 18 shows a plan view of the NiTi insert 70 differentially heat treated in FIG. 17. As shown in FIG. 18, the heat treated zone 72 is circular in shape. In heat treating the insert, a single pair of electrodes could be used to sequentially provide a series of heat treated zones 72 or a plurality of electrodes provided in a desired pattern and, having a desired configuration could be used to create any desired pattern of heat treated zones.

FIGS. 19-21 show examples of patterns of heat treated zones 78,80,82 which can be obtained by differentially heat treating NiTi 84,86,88 inserts for golf club faces. As shown in these figures, by patterning the electrodes and/or by the geometry of the electrodes themselves, differential mechanical properties can be achieved in large variety of patterns that can be idealized for control of the flight of a golf ball. FIG. 19 shows a heat treated zone 78 in the shape of an annular ring and such a heat treated zone could be created by a pair of opposed tubular electrodes. FIG. 20 shows a ring of circular heat treated zones which together form an annular zone 80 created by one or more pairs of opposed electrodes of the type shown in FIG. 17. FIG. 21 shows an example of "strip" heat treated zones 82 created by one or more pairs of opposed strip electrodes (e.g., plate-type electrodes).

"Composite" Example

FIGS. 22-23 show an example of a composite insert 90 for a striking face of a golf club. As shown in FIG. 22, the insert includes a base material 92 having one or more embedded members 94 of a material selected for purposes of modifying the properties of the insert. For instance, as shown in FIG. 22, the additional members 94 can be spaced more closely together in the central region of the insert than at the outer edges thereof. As shown in FIG. 23, the base material can include grooves 96 for receiving the additional members 94. The grooves can be provided in any desired pattern such as a uniform pattern or non-uniform pattern (e.g., the grooves can be provided with progressively increasing spacing therebetween towards the outer periphery of the insert). The material of the inserts preferably provides

a different modulus than the base material. Although the grooves are shown as extending vertically the grooves could extend in any desired direction or have any desired shape (e.g., the grooves could be provided in a horizontal, angled or mixed pattern which combines more than one shape or orientation of the grooves).

"CuNiAl Single Crystal" Example

An insert for a striking face of a golf club includes "pixels" (as described earlier) of single crystal CuNiAl. Such an insert would allow much greater deformations of the club insert striking surface. This material has extreme strain ability to deform elastically up to 12-14% strain with a "plateau" at low stress and full elastic recovery with very low hysteresis. FIG. 24 is a stress/strain curve of a wire sample of single crystal CuNiAl having a diameter of 0.060 inch. The strain properties of such material would allow a golf ball to remain on the club for a longer period of time giving an increased feel of control to the user.

"Perimeter Weighting" Example

FIG. 25 shows an example of how perimeter weighting can be added to the golf club according to the invention. In the embodiment shown, the central region 100 of the club face can include a pixel or other arrangement such as shown in FIGS. 1-23. The central region is entirely or partly surrounded by high density "pixels" 102 such as rods of heavy materials such as pure metals (e.g., uranium, tungsten, molybdenum, lead, etc.). The perimeter weighting concept allows the striking face to be made much thinner. For instance, as shown in FIG. 26, the cross-section of an "iron-type" club face 104 having the perimeter weighting 102 can be substantially uniform in thickness whereas a conventional cast or forged stainless steel iron-type club, such as is shown in FIG. 27, has an increased cross-section around the top 106 and bottom 108 thereof.

The foregoing has described the principles, preferred embodiments and modes of operation of the present invention. However, the invention should not be construed as being limited to the particular embodiments discussed. Thus, the above-described embodiments should be regarded as illustrative rather than restrictive, and it should be appreciated that variations may be made in those embodiments by workers skilled in the art without departing from the scope of the present invention as defined by the following claims.

What is claimed is:

1. A golf club head, comprising:
a striking face having a recess;
a plurality of discrete pieces of the same material distributed within the recess of the striking face, the pieces having sidewalls forming the striking face and each of the pieces having at least one sidewall in contact with a sidewall of an adjacent one of the pieces wherein the pieces are shaped to fill the recess in a close packed relationship.
2. The golf club head of claim 1, wherein the pieces have the same shapes in cross-section.
3. The golf club head of claim 2, wherein the pieces have polyhedral shapes.
4. The golf club head of claim 3, wherein the pieces have hexagonal shapes arranged in the close packed relationship.
5. The golf club head of claim 1, wherein the pieces are of a polymer or metallic material.
6. The golf club head of claim 5, wherein the pieces are of a superelastic or martensitic shape memory alloy.
7. The golf club head of claim 1, wherein the pieces have polyhedral shapes arranged in the close packed relationship.

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8. The golf club head of claim 1, wherein the striking face is the striking face of a putter, an iron-type club or a driver type club.

9. The golf club head of claim 1, wherein the pieces have identical shapes and the same or different lengths.

10. The golf club head of claim 1, wherein the striking face comprises an iron-type golf club.

11. The golf club head of claim 1, wherein the pieces comprise single crystal CuNiAl segments, the segments being arranged with central axes thereof intersecting the striking face.

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12. The golf club head of claim 1, wherein the pieces comprise curved segments arranged with ends of the curved segments intersecting the striking face.

13. The golf club head of claim 1, wherein the sidewalls of the pieces are not bonded together.

14. The golf club head of claim 1, wherein the pieces have adjacent surfaces tightly packed together.

* * * *

10/05/1998



CornerStone Partners LLC
614 East High Street
Charlottesville, Virginia 22903
Telephone: 804.296.2300
Facsimile: 804.296.0922

23 March 2000

TO: Mark King
FROM: Peter Brooks
RE: Pixel technology

Mark:

I understand from calling today that you are on the road, so allow me to take one more stab with this fax at trying to arrange a meeting with you and The Beta Group.

We had a conversation last week with Bill Reimus, and on the surface it still appears there are serious issues regarding the validity of the Nubbins patent (at least as it is presented in the European application which is the only one we've seen to date). But at this stage we are eager not to pursue the legal direction further without exploring first the potential for a more positive relationship with Taylor Made.

We believe you are serious about trying to work with outsiders in incorporating high performance technologies into Taylor Made product, and we believe our pixel technology is superior in a significant way to the Nubbins.

Our objective in meeting is simply to have a conversation so that you can understand our technology better and appreciate why we believe replacing the Nubbins with a pixel-faced product is a good idea.

We look forward to hearing from you about when would be a convenient time. I would suggest coordinating first with Bob Zider, the founder and president of The Beta Group (650-233-8700), and I will stay in touch with him.

Thanks, Mark. Hope Eddie's on board by now and already making a contribution.

Best regards,

A handwritten signature consisting of a stylized 'P' and a line extending to the right.



April 5, 2000

Taylor Made-adidas Golf Company
5545 Fermi Court
Carlsbad, CA 92008-7324
Phone 760.918.6000
Fax 760.918.6014
www.taylormadegolf.com
www.adidasgolf.com



Peter C. Brooks
CornerStone Partners LLC
614 East High Street
Charlottesville, VA 22902

Via Facsimile and Mail
804-296-0922

Dear Peter:

It was a pleasure speaking with you on March 17, 2000 regarding your letter to Mark King dated March 16, 2000. I have also reviewed your letter to Mark dated March 23, 2000.

In your letters you accuse Taylor Made of misappropriating technology of The Beta Group. In particular, you allege that Beta's pixel technology was wrongfully used in Taylor Made's Nubbins® putter. I have discussed your allegations with Dick Rugge and have reviewed the published PCT application we provided to Bob Zider regarding the Nubbins® putter. Based on this discussion and review, I see absolutely no evidence of trade secret misappropriation. If you have any remaining concerns in this regard, I would be happy to discuss them with you.

In your letters, you also propose meeting with us to further discuss the benefits of the pixel technology. As you know, we are open to exploring technologies developed by third parties. We are not interested in Beta's pixel technology, however, based on our earlier evaluation of same.

If you would like to meet with us to discuss technologies that we have not already evaluated, please let us know.

Sincerely,

William S. Reimus
Director of Legal Affairs

cc: Bob Zider (via fax No. 650-854-7682)
Mark King
Robert Erb

FROMMER LAWRENCE & HAUG LLP
745 FIFTH AVENUE NEW YORK, NEW YORK 10151

CONFIRMATION
COPY

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WILLIAM F. LAWRENCE
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MATTHEW K. RYAN
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THOMAS J. KOWALSKI
JOHN R. LANE
DENNIS M. SMITH
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May 17, 2000

VIA FACSIMILE

William S. Reimus, Esq.
Director of Legal Affairs
Taylor Made-adidas Golf Company
5545 Fermi Court
Carlsbad, California 92008-7324

Re: Beta Development Inventions/Taylor Made

Dear Mr. Reimus:

We represent Beta Development and the Beta Group ("Beta") regarding intellectual property matters. We have been asked by Beta to respond to your letter of April 5, 2000 to Peter Brooks and to clarify the very serious legal claims that our client has against Taylor Made and its personnel who were involved in the design of the Nubbins putter and the filing of related patent applications.

As you know, the principals of our client disclosed certain proprietary information, including prototypes, to Taylor Made over the course of several months during 1996-97 relating to Beta's inventions for clubface inserts. Those inventions were shared with Taylor Made in good faith and in confidence with the intention that Taylor Made and its personnel would respect the proprietary nature of Beta's inventions. During the course of those disclosures, a U.S. patent application filed by Beta was pending. That application describes and claims Beta's clubface technology, including the embodiments disclosed to Taylor Made. That patent application was granted and issued in September 1998.

Unfortunately, the seemingly cooperative discussions concerning this technology were abruptly ended by Taylor Made in mid-1997 with little or no credible explanation. Beta is now aware, through a published PCT application, that during these discussions, Taylor Made filed its own U.S. patent applications, wherein embodiments adopted from our client's inventions are described and claimed. One of the purported inventors named in the Taylor Made application, Mr. Bottoma, was privy to the proprietary information disclosed by Beta and was extensively involved in discussions and meetings with Mr. Krumme of Beta concerning this technology.

William S. Reimus, Esq.
May 17, 2000
Page 2

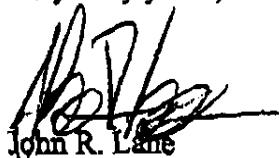
Further at the 1999 PGA Expo in Orlando, Taylor Made introduced its new Nubbins putter incorporating our client's clubface technology, which has been commercially sold by Taylor Made since that time. Indeed, Beta met with Taylor Made at that time and was assured by Taylor Made that it had acquired an issued patent relating to the Nubbins putter design solely from an outside source. In fact, Taylor Made had only filed an application, during its discussions with Beta, and included Mr. Bottoma as a co-inventor.

It is our client's strong belief that Taylor Made has (1) wrongfully and intentionally misappropriated inventions developed and patented by Beta and (2) has falsely claimed inventorship and ownership with regard to Beta's inventions by filing patent applications on its own behalf in the U.S. and elsewhere. Beta's inventions were confidential at the time the discussions took place between our respective clients and there was an expectation of confidentiality surrounding all disclosures and discussions. As such, Taylor Made has also wrongfully used and misappropriated Beta's trade secrets through its commercial use of and filing of patent applications containing Beta's proprietary information.

At this point, Beta has no interest in discussing other technologies with Taylor Made as suggested in your letter to Peter Brooks. Any future meetings or dealings with Taylor Made, should your client still wish to resolve these matters amicably, shall be restricted to remedying or otherwise resolving Taylor Made's wrongful and false acts. At a minimum, Taylor Made should suspend immediately all further sales of its Nubbins products and the prosecution of related patent applications filed, until these issues are resolved between our respective clients.

Please contact me at your earliest convenience if you would like to discuss these matters further.

Very truly yours,



John R. Lane

JRL:ad

AO 120 (3/85)

TO: Commissioner of Patents and Trademarks Washington, D.C. 20231	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT
---	--

In compliance with the Act of July 19, 1952 (66 Stat. 814; 35 U.S.C. 290) you are hereby advised
that a court action has been filed on the following patent(s) in the U.S. District Court:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT	
00cv1174	6/9/00	United States District Court, Southern District of California	
PLAINTIFF		DEFENDANT	
Taylor Made Golf Company Inc		The Beta Group	
PATENT NO.		DATE OF PATENT	PATENTEE
1 5,807,190		9/15/98	Taylor Made Golf
2			
3			
4			
5			

In the above-entitled case, the following patent(s) have been included:

DATE INCLUDED	INCLUDED BY			
	<input type="checkbox"/>	Amendment	<input type="checkbox"/>	Answer
	<input type="checkbox"/>	Cross Bill	<input type="checkbox"/>	Other Pleading
PATENT NO.		DATE OF PATENT	PATENTEE	
1				
2				
3				
4				
5				

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT		
CLERK	(BY) DEPUTY CLERK	DATE

Copy 1 - Upon initiation of action, mail this copy to Commissioner Copy 3 - Upon termination of action, mail this copy to Commissioner
Copy 2 - Upon filing document adding patent(s), mail this copy to Commissioner Copy 4 - Case file copy

AO 120 (3/85)

TO: Commissioner of Patents and Trademarks Washington, D.C. 20231	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT
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PATENT NO.		DATE OF PATENT	PATENTEE	
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PLAINTIFF Taylor Made Golf Company Inc		DEFENDANT The Beta Group
PATENT NO.	DATE OF PATENT	PATENTEE
1 5,807,190	9/15/98	Taylor Made Golf
2		
3		
4		
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In the above-entitled case, the following patent(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT NO.	DATE OF PATENT	PATENTEE
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CLERK	(BY) DEPUTY CLERK	DATE

Copy 1 - Upon initiation of action, mail this copy to Commissioner Copy 3 - Upon termination of action, mail this copy to Commissioner
Copy 2 - Upon filing document adding patent(s), mail this copy to Commissioner Copy 4 - Case file copy

CIVIL COVER SHEET

ORIGINAL

JS 44

(Rev 11/95)

The JS-44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM)

I. (a) PLAINTIFFS

TAYLOR MADE GOLF COMPANY, INC., a Delaware Limited Liability Company

DEFENDANTS

THE BETA GROUP, California limited partnership

FILED

JUN - 9 2000

COUNTY OF RESIDENCE OF FIRST LISTED DEFENDANT Menlo Park

(IN U.S. CIVIL CASES ONLY)
SOUTHERN DISTRICT COURT
TRUST OF LAND INVOLVED

ATTORNEYS (IF KNOWN)

DEPUTY

(b) COUNTY OF RESIDENCE OF FIRST LISTED PLAINTIFF
(EXCEPT IN U.S. PLAINTIFF CASES)

(c) ATTORNEYS (FIRM NAME, ADDRESS, AND TELEPHONE NUMBER)
Sheppard, Mullin, Richter & Hampton LLP
501 West Broadway
19th Floor
San Diego, California 92101
(619) 338-6500

II. BASIS OF JURISDICTION (PLACE AN "X" IN ONE BOX ONLY)

<input checked="" type="checkbox"/> 1 U.S. Government Plaintiff	<input checked="" type="checkbox"/> 3 Federal Question (U.S. Government Not a Party)
<input type="checkbox"/> 2 U.S. Government Defendant	<input type="checkbox"/> 4 Diversity (Indicate Citizenship of Parties in Item III)

III. CITIZENSHIP OF PRINCIPAL PARTIES (PLACE AN "X" IN ONE BOX FOR PLAINTIFF AND ONE BOX FOR DEFENDANT)

Citizen of This State	<input type="checkbox"/> 1	<input type="checkbox"/> 1	Incorporated or Principal Place of Business in This State	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Citizen of Another State	<input type="checkbox"/> 2	<input type="checkbox"/> 2	Incorporated and Principal Place of Business in Another State	<input type="checkbox"/> 5	<input type="checkbox"/> 5
Citizen or Subject of a Foreign Country	<input type="checkbox"/> 3	<input type="checkbox"/> 3	Foreign Nation	<input type="checkbox"/> 6	<input type="checkbox"/> 6

IV. ORIGIN

(PLACE AN "X" IN ONE BOX ONLY)

1 Original Proceeding 2 Removed from State Court 3 Remanded from Appellate Court 4 Reinstated or Reopened 5 another district (specify) 6 Multidistrict Litigation

Appeal to District Judge from
7 Magistrate Judgment

V. NATURE OF SUIT (PLACE AN "X" IN ONE BOX ONLY)

CONTRACT	TORTS	FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES
<input type="checkbox"/> 110 Insurance	PERSONAL INJURY	610 Agriculture	422 Appeal	400 State Reapportionment
<input type="checkbox"/> 120 Marine	<input type="checkbox"/> 310 Airplane	620 Other Food & Drug	28 USC 158	410 Antitrust
<input type="checkbox"/> 130 Miller Act	<input type="checkbox"/> 315 Airplane Product Liability	625 Drug Related Seizure of Property 21 USC 881	423 Withdrawal	430 Banks and Banking
<input type="checkbox"/> 140 Negotiable Instrument	<input type="checkbox"/> 320 Assault, Libel & Slander	368 Asbestos Personal Injury Product Liability	28 USC 157	450 Commerce/ICCRates/etc
<input type="checkbox"/> 150 Recovery of Overpayment & Enforcement of Judgment	<input type="checkbox"/> 330 Federal Employers' Liability	PERSONAL PROPERTY	PROPERTY RIGHTS	460 Deportation
<input type="checkbox"/> 151 Medicare Act	<input type="checkbox"/> 340 Marine	<input type="checkbox"/> 370 Other Fraud	<input type="checkbox"/> 820 Copyrights	470 Racketeer Influenced and Corrupt Organizations
<input type="checkbox"/> 152 Recovery of Defaulted Student Loans (Excl. Veterans)	<input type="checkbox"/> 345 Marine Product Liability	<input type="checkbox"/> 371 Truth in Lending	<input checked="" type="checkbox"/> 830 Patent	810 Selective Service
<input type="checkbox"/> 153 Recovery of Overpayment of Veteran's Benefits	<input type="checkbox"/> 350 Motor Vehicle	<input type="checkbox"/> 380 Other Personal Property Damage	<input type="checkbox"/> 840 Trademark	850 Securities/Commodities/ Exchange
<input type="checkbox"/> 160 Stockholders' Suits	<input type="checkbox"/> 355 Motor Vehicle Product Liability	<input type="checkbox"/> 385 Property Damage Product Liability	SOCIAL SECURITY	875 Customer Challenge
<input type="checkbox"/> 190 Other Contract	<input type="checkbox"/> 360 Other Personal Injury		<input type="checkbox"/> 861 HIA (1395ff)	12 USC 3410
<input type="checkbox"/> 195 Contract Product Liability			<input type="checkbox"/> 862 Black Lung (923)	891 Agricultural Acts
REAL PROPERTY	CIVIL RIGHTS	PRISONER PETITIONS	<input type="checkbox"/> 863 DIWC/DIWW (405(g))	892 Economic Stabilization Act
<input type="checkbox"/> 210 Land Condemnation	<input type="checkbox"/> 441 Voting	<input type="checkbox"/> 510 Motions to Vacate Sentence	<input type="checkbox"/> 864 SSID Title XVI	893 Environmental Matters
<input type="checkbox"/> 220 Foreclosure	<input type="checkbox"/> 442 Employment	<input type="checkbox"/> 530 General	<input type="checkbox"/> 865 RSI (405(g))	894 Energy Allocation Act
<input type="checkbox"/> 230 Rent Lease & Ejectment	<input type="checkbox"/> 443 Housing/ Accommodations	<input type="checkbox"/> 535 Death Penalty	FEDERAL TAX SUITS	895 Freedom of Information Act
<input type="checkbox"/> 240 Torts to Land	<input type="checkbox"/> 444 Welfare	<input type="checkbox"/> 540 Mandamus & Other	<input type="checkbox"/> 870 Taxes (U.S. Plaintiff or Defendant)	900 Appeal of Fee Determination Under Equal Access to Justice
<input type="checkbox"/> 245 Tort Product Liability	<input type="checkbox"/> 440 Other Civil Rights	<input type="checkbox"/> 550 Civil Rights	<input type="checkbox"/> 871 IRS - Third Party	950 Constitutionality of State Statutes
<input type="checkbox"/> 290 All Other Real Property			26 USC 7609	890 Other Statutory Actions

VI. CAUSE OF ACTION

(CITE THE U.S. CIVIL STATUTE UNDER WHICH YOU ARE FILING AND WRITE A BRIEF STATEMENT OF CAUSE.
DO NOT CITE JURISDICTIONAL STATUTES UNLESS DIVERSITY.) This is an action for declaratory relief regarding patent rights. 28 USC Section 2201 *dj MAM*

VII. REQUESTED IN COMPLAINT:

CHECK IF THIS IS A CLASS ACTION
UNDER F.R.C.P. 23

DEMAND \$ Decl. Jdgmt

CHECK YES only if demanded in complaint:

JURY DEMAND: YES NO VIII. RELATED CASE(S) (See instructions):
IF ANY

JUDGE

DOCKET NUMBER

DATE
June 9, 2000FOR OFFICE USE ONLY
RECEIPT # *861027*AMOUNT *\$150.00*

APPLYING IPP

JUDGE

MAG. JUDGE

FD-JS44

Robert S. Gerber